

Nova Law Review

Volume 42, Issue 3

2018

Article 2

Control On Blockchain Network

Aleksei Gudkov*

*Autonomous University of Barcelona

Copyright ©2018 by the authors. *Nova Law Review* is produced by The Berkeley Electronic Press (bepress). <https://nsuworks.nova.edu/nlr>

CONTROL ON BLOCKCHAIN NETWORK

ALEKSEI GUDKOV*

I.	INTRODUCTION.....	354
A.	<i>The History of the Networking Groups</i>	355
1.	Roman Associations	355
2.	Canon Law	356
II.	THE FEATURES OF BLOCKCHAIN	357
A.	<i>Code Dependence</i>	357
B.	<i>Anonymity</i>	357
C.	<i>Immutability and Irreversibility</i>	358
D.	<i>Distributed Jurisdiction</i>	358
E.	<i>Reputation</i>	359
F.	<i>The Cohesion of Users</i>	360
III.	THE CONTROL DEFINITION	360
A.	<i>General Understanding of Control</i>	360
B.	<i>Legal Definition of Control</i>	361
C.	<i>Social Approach to Control</i>	362
D.	<i>Economic Approach to Control</i>	362
E.	<i>Technological Approach to Control</i>	363
F.	<i>Blockchain Approach</i>	363
IV.	INDIVIDUAL CONTROL	363
A.	<i>Program Code Vulnerability: The Parity Case</i>	364
B.	<i>Fatal Program-Program Interaction Case</i>	365
V.	CONTROL OVER THE DECENTRALIZED NETWORK	
	ORGANIZATION	368
A.	<i>Definition of the Decentralized Network Organization</i>	368
B.	<i>The Structure of Decentralized Network Organization</i>	368
C.	<i>Club of Purchasers</i>	369
D.	<i>Single Organization with a Membership</i>	370
E.	<i>Trust</i>	370
VI.	CONTROL OVER NETWORK BY GOVERNMENT AUTHORITIES.....	371
A.	<i>Entrance-Exit Nodes</i>	372
B.	<i>EEN—Vinnik Case</i>	372
C.	<i>Control over Network Is Control over Identity</i>	373
VII.	CONCLUSION	373

I. INTRODUCTION

One of the key problems of blockchain technology is the lack of control of users, organized societies, and state authorities over the transactions and assets on the decentralized network.¹ The distributed ledger and blockchain are interesting examples of new technologies, which revolutionize rules not only for users, but also for governments.² Technology-driven rules can be viewed as technological law for blockchain users and legislative authorities.³ No legal regulation can change the anonymity or immutability of blockchain.⁴ Only another technology could turn the situation around.⁵ This is a lesson for every lawyer to learn not only the law, but also the scope of technology.⁶

The purpose of this Article is to analyze modern determinants of control distribution over assets, transactions, and decentralized organizations on blockchain distributed network.⁷ This Article shows how control appears in a variety of different situations on blockchain networks.⁸ Examples range from individual to organizational control over the networking system—including the possibility for the participants to exercise control.⁹

This Article will derive the effectiveness and the best practice for the regulation of blockchain technology.¹⁰ On the base of the legal cases in blockchain industry, this Article will discuss the ability of users, governments, and founders of crypto-communities to control both transactions and assets on decentralized blockchain network.¹¹

* Aleksei Gudkov is a PhD candidate for the 2018 year at Autonomous University of Barcelona. Aleksei is grateful for the NSU Shepard Broad College of Law and all of those with whom he has had the pleasure to meet during the 2017 Nova Law Review Symposium Entrepreneurship 2.0 and for their wonderful hospitality. He also wishes to thank his wife, Tatiana, who provided support. Aleksei would especially like to thank the Editor-in-Chief of the Nova Law Review Vol. 42 Mr. Stephen Ayeni, the Lead Articles Editor Ms. Brittany Ehrenman, and editors for their hard work and dedication to improving this Article.

1. See Ed Featherston, *Blockchain: You Want Me to Trust a "Trustless Trust" System?*, CLOUD TECH. PARTNERS: THE DOPPLER (Nov. 15, 2017), <http://www.cloudtp.com/doppler/blockchain-you-want-me-to-trust-a-trustless-trust-system/>.

2. See Marco Iansiti & Karim R. Lakhani, *The Truth About Blockchain*, HARV. BUS. REV., Jan.–Feb. 2017, at 118, 120, 125.

3. See *id.*

4. Wulf A. Kaal & Craig Calcaterra, *Crypto Transaction Dispute Resolution*, 73 BUS. LAW. 109, 110 (2017).

5. See *id.*

6. Iansiti & Lakhani, *supra* note 2, at 126–27.

7. See *infra* Parts II–VII.

8. See *infra* Parts III–VI.

9. See *infra* Parts IV–VI.

10. See *infra* Parts II–VI.

11. See *infra* Parts IV–VI.

A. *The History of the Networking Groups*

1. Roman Associations

We have a long-lasting history of communities.¹² The blockchain and smart contract technology enables individuals to initiate and participate in organized societies and networking groups.¹³ New virtual communities and distributed network organizations are spread across the world.¹⁴ But these are all the same, well-known, old-fashioned communities.¹⁵ The main difference between them are technological features.¹⁶ Due to newer technology, information spreads faster.¹⁷ The transactions executed on distributed ledgers are more reliable.¹⁸ Yet, the networking groups themselves are very simplistic,¹⁹ and their governance system is very primitive.²⁰ It is noteworthy that the process of the groups' formations on the blockchain is spontaneous, and similar to ancient Roman associations' practice of establishment.²¹

According to the Roman law of the Twelve Tables,²² the first associations were rural, professional, and religious associations.²³ These associations had freedom of action and could exist in any form.²⁴ The first Roman associations acted on the basis of simple community statutes and had no duty of registration.²⁵ Similarly, the contemporary decentralized organizations on blockchain—in most cases—act only on the grounds of a *white paper*.²⁶

12. See Louis F. Del Duca, *Teachings of the European Community Experience for Developing Regional Organizations*, 11 DICK. J. INT'L L. 485, 488, 493 (1993).

13. See Michael Crider, *What Is a "Blockchain"?*, HOW-TO GEEK (Dec. 13, 2017), <http://www.howtogeek.com/335814/what-is-a-blockchain/>.

14. See *id.*

15. See Iansiti & Lakhani, *supra* note 2, at 119–20.

16. See *id.* at 120.

17. See *id.* at 123.

18. See *id.*; Crider, *supra* note 13.

19. See Iansiti & Lakhani, *supra* note 2, at 120–21.

20. See *id.*

21. See *id.* at 121, 123; Per Samuelsson, *On the Evolution of Corporate Forms*, 2005 U. ILL. L. REV. 15, 21.

22. E.B. Conant, *The Laws of the Twelve Tables*, 13 ST. LOUIS L. REV. 231, 231 (1928).

23. D.V. DOZHDEV, RIMSKOE CHASTNOE PRAVO 297 (2d ed. 1999).

24. See *id.*; Samuelsson, *supra* note 21, at 21.

25. See DOZHDEV, *supra* note 23, at 297.

26. See Iansiti & Lakhani, *supra* note 2, at 121, 123; *White Paper*, INVESTOPEDIA, <http://www.investopedia.com/terms/w/whitepaper.asp> (last visited Apr. 18, 2018).

Later, the *lex Iulia de collegiis*,²⁷ at the time of Augustus, determined the types of associations that could exist.²⁸ The creation of associations was subject to the authorization of the Senate or the Emperor—i.e., *ex senatus consulto coire licet*.²⁹

The *Gai*³⁰ describes the types of permitted associations: Farmers—i.e., *societates vectigalium publicorum*; fishermen—i.e., *pistorum*; and sailors—i.e., *naviculariurum*.³¹

In this historical example, you can see what happened with society and its regulation.³² It took four centuries to restrict the freedom of association.³³ But now, everything happens faster.³⁴ We should expect that decentralized network organizations, based on the blockchain, will also be classified and restricted in every possible way.³⁵

2. Canon Law

Another historical example is church regulation.* According to Harold J. Berman, a corporation was often formed under Canon law—church law—in absence of state permission, which is similar to the formation of decentralized network organizations.³⁶ Under Canon law, any group of persons who had the requisite structure and purpose—for example, “a hospital or a body of students, as well as a bishopric”—constituted a corporation without special permission of a higher authority.³⁷

27. DOZHDEV, *supra* note 23, at 297.

28. *Id.*

29. *Id.* at 299.

30. GAIUS, *GAI INSTITVTIONES OR INSTITUTES OF ROMAN LAW* 1 (Edward Poste trans., Oxford at the Clarendon Press 4th ed. 1904) (c. 160 A.D.).

31. See DOZHDEV, *supra* note 23, at 297; GAIUS, *supra* note 30, at 119.

32. See Conant, *supra* note 22, at 231; DOZHDEV, *supra* note 23, at 119.

33. See Conant, *supra* note 22, at 231.

34. See Alison E. Berman & Jason Dorrier, *Technology Feels Like It's Accelerating — Because It Actually Is*, SINGULARITYHUB (Mar. 22, 2016), <http://www.singularityhub.com/2016/03/22/technology-feels-like-its-accelerating-because-it-actually-is/#sm.0000fu9ot913ftfh8z83eai3van7z>.

35. See SEC, RELEASE NO. 81207, REPORT OF INVESTIGATION PURSUANT TO SECTION 21(A) OF THE SECURITIES EXCHANGE ACT OF 1934: THE DAO 1–2 (2017); Ian Bogost, *Cryptocurrency Might Be a Path to Authoritarianism*, ATLANTIC: TECH. (May 30, 2017), <http://www.theatlantic.com/technology/archive/2017/05/blockchain-of-command/528543/>; *What Is a DAO?*, BLOCKCHAINHUB, <http://www.blockchainhub.net/dao-decentralized-autonomous-organization/> (last visited Apr. 18, 2018).

36. HAROLD J. BERMAN, *LAW AND REVOLUTION: THE FORMATION OF WESTERN LEGAL TRADITION* 219 (1983); see also *What Is a DAO?*, *supra* note 35.

37. BERMAN, *supra* note 36, at 219.

It can be said under Canon law, although the head of a corporation—church—did not own the property of the corporation, he was entitled the power to control the corporation.³⁸ At the same time, members of the corporation have the right to make decisions in some cases, and also elect the head of a corporation.³⁹ The same governance structure can be established in the decentralized autonomous organization (“DAO”).⁴⁰ Participants of an organization can vote and make certain decisions.⁴¹ The founders control the assets of the organization.⁴²

II. THE FEATURES OF BLOCKCHAIN

A. *Code Dependence*

The entire distributed ledger network is based on the logic of a few lines of code.⁴³ Every block in the blockchain is a software-generated container that bundles together the messages relating to a particular transaction.⁴⁴

B. *Anonymity*

The blockchain technology provides privacy and anonymity to users, despite transaction information being publicly available.⁴⁵ Blockchain public addresses hide identity.⁴⁶ The public address is just a string of random characters.⁴⁷ At the same time, the blockchain is transparent so everyone can see transaction information, which is included in a block.⁴⁸ Using a block explorer you can discover: A block number, hash of a transaction, the address of the sender or recipient, the value of the transaction, and the balance.⁴⁹

38. *Id.* at 216, 221.

39. *See id.* at 219, 221.

40. *See* SEC, *supra* note 35, at 7–8.

41. *Id.* at 7.

42. *Id.* at 7–8.

43. Steve Cox, *What Is Blockchain? A Primer for Finance Professionals*, FORBES: ORACLEVOICE (Aug. 21, 2017, 5:00 AM), <http://www.forbes.com/sites/oracle/2017/08/21/what-is-blockchain-a-primer-for-finance-professionals/>; *see also* Kaal & Calcaterra, *supra* note 4, at 126 n.50.

44. Cox, *supra* note 43; Kaal & Calcaterra, *supra* note 4, 118.

45. Kaal & Calcaterra, *supra* note 4, at 113.

46. *Id.* at 111.

47. *See id.*

48. *Id.*; Cox, *supra* note 43.

49. BITCOIN BLOCK EXPLORER, <http://www.blockexplorer.com/> (last visited Apr. 18, 2018).

Therefore, we can say that investments in decentralized network organizations are pseudonymous—“i.e., an individual’s or entity’s pseudonym was [used as its] [b]lockchain address.”⁵⁰ This pseudonymous aspect of decentralized network organizations presents a challenge for state authority to exert effective control over blockchain transactions.⁵¹ To determine a person’s identity on the blockchain, a cluster analysis—a location of addresses—and a big data analysis can be used, but it is still a complicated process.⁵²

C. *Immutability and Irreversibility*

All transactions on the blockchain network are immutable.⁵³ The history of transactions is built upon a distributed ledger—layer by layer.⁵⁴ More importantly, the chain of blocks cannot be destroyed.⁵⁵ The key implication is that every mistake on a blockchain is fatal.⁵⁶ Once a mistake is made, it cannot be revised.⁵⁷

D. *Distributed Jurisdiction*

Due to the intersection of a large number of users and providers on the distributed network, there is a great uncertainty about applicable law and jurisdiction.⁵⁸ The jurisdiction is shared by many participants in every single case.⁵⁹ *Distributed Jurisdictional* means, to necessitate governance from within the blockchain technology itself to effectively address the inherent problems within blockchain-based smart contracts.⁶⁰

50. SEC, *supra* note 35, at 6.

51. *See id.* at 6; Kaal & Calcaterra, *supra* note 4, at 125.

52. *See* Steven McKie, *The Blockchain Meets Big Data and Realtime Analysis*, BITCOIN MAG.: NEWS (June 24, 2015, 5:57 PM), <http://bitcoinmagazine.com/articles/blockchain-meets-big-data-realtime-analysis-1435183048>; Tamer Sameeh, *Bitcoin Address Clustering (New Heuristics) — Part 1*, LIVE BITCOIN NEWS (Apr. 12, 2017, 2:17 AM), <http://www.livebitcoinnews.com/bitcoin-address-clustering-new-heuristics-part-1/>.

53. Kaal & Calcaterra, *supra* note 4, at 114.

54. *Id.* at 114–15, 118.

55. *See id.* at 125.

56. *See id.* at 115.

57. *Id.*

58. Kaal & Calcaterra, *supra* note 4, at 127–28.

59. *Id.* at 151.

60. *Id.* at 142–43.

E. *Reputation*

“[B]lockchain [operates as] a *trustless* . . . system.”⁶¹ Most interactions in blockchain communities are fulfilled remotely and in the absence of traditional community recommendations.⁶² Contrary to common opinion, blockchain does not provide trust.⁶³ Blockchain is a trustless system due to cryptographic technology.⁶⁴ Smart contracts guarantee the execution of a transaction, regardless of the personal relationship or trust.⁶⁵ The cryptographic technology ensures the execution, but not the relationship.⁶⁶

The relationships among users on the decentralized network are based on reputation.⁶⁷ The impartiality among members of the blockchain network community is possible on the basis of shared reputations.⁶⁸ Publicly available profiles, transparency of historical data, and the absence of legalities are the foundations of all transactions on a blockchain network.⁶⁹ In a system where rule-codes in blockchain applications are unclear—even for experienced users—and there is no applicable law, a user’s reputation is the most important asset.⁷⁰ Natural law prevails on the decentralized network.⁷¹

Justice and culture are based on morality and traditions,⁷² especially on the blockchain network.⁷³ The positive law—the law adopted by proper authority—does not work in communities based on the blockchain

61. Featherston, *supra* note 1.

62. See ALLEN & OVERY LLP, *Decentralized Autonomous Organizations* 2–3 (2016), <http://www.allenoverly.com/SiteCollectionDocuments/Article%20Decentralized%20Autonomous%20Organizations.pdf>; Featherston, *supra* note 1; *What Is a DAO?*, *supra* note 35.

63. Featherston, *supra* note 1.

64. *Id.*; see also Cox, *supra* note 43.

65. WILLIAM MOUGAYAR, *THE BUSINESS BLOCKCHAIN: PROMISE, PRACTICE, AND APPLICATION OF THE NEXT INTERNET TECHNOLOGY* 30–32 (2016); see also Kaal & Calcaterra, *supra* note 4, at 133–34.

66. Featherston, *supra* note 1.

67. Marcella Atzori, *Blockchain Technology and Decentralized Governance: Is the State Still Necessary?* 22 (Dec. 1, 2015) (unpublished article) (on file with SSRN); Matthew Carano, *Blockchain Reputation — Promoting Good Actors in a Free Society*, SWARM CITY TIMES (Nov. 10, 2017), <http://press.swarm.city/blockchain-reputation-promoting-good-actors-in-a-free-society-8f6117069cde>.

68. See MOUGAYAR, *supra* note 65, at 34; Atzori, *supra* note 67, at 22; Carano, *supra* note 67.

69. See ALLEN & OVERY LLP, *supra* note 62, at 3; Crider, *supra* note 13.

70. See MOUGAYAR, *supra* note 65, at 34; Crider, *supra* note 13.

71. See Atzori, *supra* note 67, at 10.

72. See ELLIOT TURIEL, *THE CULTURE OF MORALITY: SOCIAL DEVELOPMENT, CONTEXT, AND CONFLICT* vii–viii (2002).

73. See Featherston, *supra* note 1; *What Is a DAO?*, *supra* note 35.

technology due to the decentralized character of the network.⁷⁴ Presently, there is imbalance between positive and natural law in the blockchain industry, with there being a preference for natural law.⁷⁵ However, many state authorities are taking action.⁷⁶

F. *The Cohesion of Users*

The users of blockchain networks are linked to each other on the foundation of individual interests to obtain benefits.⁷⁷ At the same time, participants of the decentralized network organization are focused not only on individual benefits, but also on common tasks that are dedicated to the specific project of the decentralized organization.⁷⁸ The cohesion of members of the network increases proportionally to the members' input to the project.⁷⁹

III. THE CONTROL DEFINITION

There are general, legal, social, technological, and economic approaches to the control aspect.⁸⁰

A. *General Understanding of Control*

Broadly speaking, the term control as a state means: Power to order, limit, or rule;⁸¹ power to influence or direct;⁸² power to make decisions about

74. See Bidzina Savaneli, *The Co-Existence of Public Positive Law and the Private Normative Order: The Constant Spiral of the Developing Interaction and Mutual Transition Between Positive Law and Normative Order*, 6 J. JURIS. 247, 255, 257 (2010); *What Is a DAO?*, *supra* note 35.

75. See ALLEN & OVERY LLP, *supra* note 62, at 5; Atzori, *supra* note 67, at 9–10.

76. Erin Jane Illman & Sean C. Wagner, *Federal and State Authorities Take First Steps Toward Regulating Blockchain, Mobile Banking and Digital Financial Services*, BRADLEY: FIN. SERVS. PERSP. (Sept. 21, 2016), <http://www.financialservicesperspectives.com/2016/09/federal-and-state-authorities-take-first-steps-toward-regulating-blockchain-mobile-banking-and-digital-financial-services/>; Francine McKenna, *Here's How the U.S. and the World Regulate Bitcoin and Other Cryptocurrencies*, MARKETWATCH: ECONOMY & POLITICS (Dec. 28, 2017, 11:19 AM), <http://www.marketwatch.com/story/heres-how-the-us-and-the-world-are-regulating-bitcoin-and-cryptocurrency-2017-12-18>.

77. See Crider, *supra* note 13; Featherston, *supra* note 1.

78. See Crider, *supra* note 13.

79. See ALLEN & OVERY LLP, *supra* note 62, at 3.

80. See 17 C.F.R. § 160.3(j) (2014); Taxation (International and Other Provisions) Act 2010, c.18, § 371RB (Eng.); *Control*, CAMBRIDGE ADVANCED LEARNER'S DICTIONARY (4th ed. 2013).

how something is managed or done; or the ability to direct the actions of someone or something.⁸³ Having no control means having freedom to do something independent from everyone.⁸⁴ The objects of control are something, someone's actions or behavior,⁸⁵ or the course of events.⁸⁶

B. *Legal Definition of Control*

In legislation, control is usually defined as a right to hold the majority of the voting rights, or to appoint or remove the majority of the members of the board of directors,⁸⁷ and to possibly *exercis[e] decisive influence*⁸⁸ or *dominant influence*.⁸⁹ According to the U.S. Code of Federal Regulations, the “[c]ontrol of a company means the power to exercise a controlling influence over the management or policies of a company whether through ownership of securities, by contract, or otherwise.”⁹⁰ According to European Union accounting standards, “[c]ontrol is the power to govern the financial and operating policies of an entity so as to obtain benefits from its activities.”⁹¹

These legal definitions of control are of more concern to the management of a corporation with a sophisticated governance structure.⁹² The legal person could be a participant of blockchain networks—although,

81. *Control*, MERRIAM-WEBSTER'S DICTIONARY AND THESAURUS (rev. ed. 2014).

82. *Id.*

83. *Id.*

84. *See id.*; *Control*, *supra* note 80.

85. *Behavior*, CAMBRIDGE ADVANCED LEARNER'S DICTIONARY (4th ed. 2013).

86. *Event*, OXFORD PAPERBACK DICTIONARY AND THESAURUS (3d ed. 2009).

87. *See* Companies Act 2006 c. 46, § 89J (Eng.), http://www.legislation.gov.uk/ukpga/2006/46/pdfs/ukpga_20060046_en.pdf.

88. Council Regulation 139/2004, art. 3, 2004 O.J. (L 24) 7 (EC).

89. Directive 2012/30/EU, of the European Parliament and of the Council of 25 October 2012 on Coordination of Safeguards Which, for the Protection of the Interests of Members and Others, Are Required by Member States of Companies Within the Meaning of the Second Paragraph of Article 54 of the Treaty on the Functioning of the European Union, in Respect of the Formation of Public Limited Liability Companies and the Maintenance and Alteration of Their Capital, With a View to Making Such Safeguards Equivalent, 2012 O.J. (L 315) 74, 84.

90. 17 C.F.R. § 160.3(j) (2014).

91. Commission Regulation 632/2010, of 19 July 2010 Amending Regulation No 1126/2008 Adopting Certain International Accounting Standards in Accordance with Regulation No 1606/2002 of the European Parliament and of the Council as Regards International Accounting Standard 24 and International Financial Reporting Standard 8, 2010 O.J. (L 186) 1, 6.

92. *See* 17 C.F.R. § 160.3(j); Commission Regulation 632/2010, *supra* note 91, at 6; *Control*, *supra* note 80.

the decentralized virtual organization on the blockchain is rarely organized as a legal entity.⁹³

C. *Social Approach to Control*

As a network is more about humans than assets, I believe that the ability to direct the actions of a network community denotes control of the community.*

D. *Economic Approach to Control*

Economic indicators of control can be grounded on the base of tax and other similar legislation.⁹⁴ From an economic point of view defined in the Taxation Act,⁹⁵ control is the ability of controlling persons to receive directly or indirectly and whether at the time of the event or later:

[I]f the whole of [company's] *share capital* were disposed of, receive—directly or indirectly and whether at the time of the disposal or later—over [fifty percent] of the proceeds of the disposal,

[I]f the whole of [company's] *income* were [disposed of], receive—directly or indirectly and whether at the time of the [disposal] or later—over [fifty percent] of the distributed amount, or

[I]n the event of the winding-up of [company] or in any other circumstances, receive—directly or indirectly and whether at the time of the winding-up or other circumstances or later—over [fifty percent] of [company's] *assets* which would then be available for distribution.⁹⁶

93. See SEC, *supra* note 35, at 1–3; CHRISTOPHER JENTZSCH, DECENTRALIZED AUTONOMOUS ORGANIZATION TO AUTOMATE GOVERNANCE 1 (2016).

94. See Taxation (International and Other Provisions) Act 2010, c.18, § 371RB (Eng.).

95. *Id.*

96. *Id.* (emphasis added).

E. *Technological Approach to Control*

Inability to manage and appropriately use program code and software leads to loss of information, crypto assets, and communication channels with communities.⁹⁷

F. *Blockchain Approach*

There is a special definition of control for the blockchain industry.⁹⁸ According to the Uniform Law Commission, “[c]ontrol means, [w]hen used in reference to a transaction or relationship involving virtual currency, [the] power to execute unilaterally or prevent indefinitely a virtual-currency transaction.”⁹⁹ In regard to the distributed network, we can define control on an individual level as a technical control, control on an organizational level as a control over group, and control on a system level as a governmental control.¹⁰⁰

IV. INDIVIDUAL CONTROL

Individual control over a network or decentralized organization starts with the control of the user’s own assets and transactions.¹⁰¹ The user has to manage a wallet, store a private key, and make transactions through ambiguous intermediaries with confusing algorithms, for which its functioning principle is unclear.¹⁰² Most challenging is maintaining control over the technological features and processes, which are not even fully comprehensible.¹⁰³ Control over the cryptocurrency wallet can be lost due to

97. See Roger Aitken, *In Blockchain we Trust? Not Yet, Say Consumers*, FORBES: INVESTING (Sept. 23, 2017, 11:57 AM), <http://www.forbes.com/sites/rogeraitken/2017/09/23/in-blockchain-we-trust-not-yet-say-consumers/>; Featherston, *supra* note 1; Matthew Sparkes, *The £625m Lost Forever — The Phenomenon of Disappearing Bitcoins*, TELEGRAPH: TECH. NEWS (Jan. 23, 2015, 7:00 AM), <http://www.telegraph.co.uk/technology/news/11362827/the-625m-lost-forever-the-phenomenon-of-disappearing-Bitcoins.html>.

98. See UNIF. REGULATION OF VIRTUAL-CURRENCY BUS. ACT § 102(3)(A) (UNIF. LAW COMM’N, Proposed Official Draft 2017).

99. *Id.*

100. See *id.* § 102(3)(B), (10).

101. See Aitken, *supra* note 97; ALLEN & OVERY LLP, *supra* note 62, at 3; *What Is a DAO?*, *supra* note 35.

102. See Featherston, *supra* note 1; *Your Bitcoin Banking Experience*, BITWALA: WALLET, <http://www.bitwala.com/wallet/> (last visited Apr. 18, 2018).

103. See Aitken, *supra* note 97; Featherston, *supra* note 1; Sparkes, *supra* note 97.

a user's mistake, carelessness, software problems, or hardware failure.¹⁰⁴ As a result, more than twenty-five percent of bitcoins are lost forever.¹⁰⁵

A. *Program Code Vulnerability: The Parity Case*

As the blockchain technology is completely founded on code-based rules, understanding the program script is very important for successful management of assets.¹⁰⁶ Even experienced developers cannot guarantee code security.¹⁰⁷ One example of a code-based attack was a Parity case in 2017.¹⁰⁸ An unknown hacker used a vulnerability in an Ethereum wallet client to steal over 150,000 Ether, worth over \$30 million.¹⁰⁹ The hack was possible due to a flaw in the Parity Ethereum's client.¹¹⁰ The coding patterns were not effectively and securely implemented.¹¹¹ The hacker made a call to `initWallet` and moved the constructor logic into a separate library, which made all functions from the library publicly available.¹¹²

The hacker transferred 10,000 Ether to each of the seven addresses.¹¹³ As all addresses were available on the distributed ledger, we can trace all transactions.¹¹⁴ Here is an example of the chain of transactions:¹¹⁵

```
1. Balance ether 83,017 address
0xB3764761E297D6f121e79C32A65829Cd1dDb4D32 send ether 10,000 to;
1.1. 0x4De76b3dfD38292Ba71cF2465Ca3a1d526dCB567 send ether 100 to;
```

104. Sparkes, *supra* note 97.

105. Martin YK Li, *How Much Bitcoin Has Been 'Lost' Forever?*, SEEKING ALPHA (June 21, 2017, 1:30 PM), <http://www.seekingalpha.com/article/4082979-much-bitcoin-lost-forever>.

106. See Peter Van Valkenburgh et al., *Distributed Collaborative Organisations: Distributed Networks & Regulatory Frameworks* 8 (Dec. 27, 2014) (on file with Bollier.org); Haseeb Qureshi, *A Hacker Stole \$31M of Ether — How It Happened, and What It Means for Ethereum*, MEDIUM: FREECODECAMP (July 20, 2017), <http://medium.freecodecamp.org/a-hacker-stole-31m-of-ether-how-it-happened-and-what-it-means-for-ethereum-9e5dc29e33ce>.

107. See Richard Chirgwin, *\$30 Million Below Parity: Ethereum Wallet Bug Fingering in Mass Heist*, REGISTER: SECURITY (July 20, 2017, 12:55 AM), http://www.theregister.co.uk/2017/07/20/us30_million_below_parity_ethereum_bug_leads_to_big_coin_heist/.

108. *Id.*; Qureshi, *supra* note 106.

109. Chirgwin, *supra* note 107.

110. Qureshi, *supra* note 106.

111. *See id.*

112. *Id.*; Francisco Memoria, *Parity Wallet Hacker Cashes Out \$90,000 of Stolen Ethereum Funds*, CRYPTO COINSNEWS (July 21, 2017, 7:17 PM), <http://www.ccn.com/parity-wallet-hacker-cashes-out-90000-of-stolen-ethereum-funds/>.

113. Memoria, *supra* note 112.

114. *Id.*; see also Crider, *supra* note 13.

115. Memoria, *supra* note 112.

1.1.1. 0x2027Cd5FB86A73c68775a366D1c2d9e8fE029483 sent ether 99.9 to; 1.1.1.1. 0x96fC4553a00C117C5b0bED950Dd625d1c16Dc894.¹¹⁶ The last address 0x96fC4553a00C117C5b0bED950Dd625d1c16Dc894 was cryptocurrency exchange, changelly.com, which works as a mixer, in which a sender and recipient could be a different person or have different addresses, but use the same wallet.¹¹⁷ Most of the hacker's funds were then transferred through intermediaries' addresses to changelly.com.¹¹⁸

B. *Fatal Program-Program Interaction Case*

A mistake can be derived not only from user-program interaction, but also program-program interplay.¹¹⁹ We assume that a program works properly, but their interaction could be fatal for a user.¹²⁰ For example, to make transactions on blockchain you need an account's private key.¹²¹ This is an automatic process.¹²²

This seemingly simple action can lead to an unexpected result.¹²³ Non-English-speaking countries often use Google Chrome with automatic translation of websites.¹²⁴ While you are going to obtain a private key, Google Chrome automatically translates the private key from English to a foreign language.¹²⁵ Unfortunately, the translated private key cannot be used.¹²⁶ Access to the account and cryptocurrency is effectively lost.¹²⁷ To illustrate this fatal program-program interaction, I have chosen a bitcoin online wallet—Bitwala.¹²⁸ The wallet produces a private key encrypted with the wallet password.¹²⁹

116. *Id.*

117. *See id.*

118. *See id.*

119. *See* Iansiti & Lakhani, *supra* note 2, at 120–21, 123; Aitken, *supra* note 97; Sparkes, *supra* note 97.

120. Crider, *supra* note 13.

121. Sudhir Khatwani, *Bitcoin Private Keys: Everything You Need to Know*, COINSUTRA, <http://www.coinsutra.com/bitcoin-private-key/> (last updated Feb. 2, 2018).

122. *Id.*; Featherston, *supra* note 1.

123. *See* Khatwani, *supra* note 121.

124. Stephen Shankland, *Google Translate Now Serves 200 Million People Daily*, CNET: NEWS (May 18, 2013, 9:40 AM), <http://www.cnet.com/news/google-translate-now-serves-200-million-people-daily/>.

125. *See id.*

126. *See id.*; Khatwani, *supra* note 121.

127. *See* Khatwani, *supra* note 121; Sharkland, *supra* note 124.

128. *Your Bitcoin Banking Experience*, *supra* note 102; *see also* Iansiti & Lakhani, *supra* note 2, at 120–21, 123; Sharkland, *supra* note 124.

129. *Your Bitcoin Banking Experience*, *supra* note 102.

This is the original private key:

```
{"iv":"6htm0TUYJhEQNwXIcVWJgA==","v":1,"iter":10000,"ks":256,"ts":64,"mode":"ccm","adata":"","cipher":"aes","salt":"skziDA4LN9M=","ct":"9d3cyR546SDOwvufxpcncqGpLjBKufwS+XVDvqw1s5peeVDH4zILe9G4fxtbXt1tw6B9/WoIjxHhWhVu5fyYX7p8arKE8tbDRIfp3NqUHCAIYdnk3hsl36izwYO2FG5Gf5VTMCEquTXmYBltNhtf4RFmgeMOhk="}
```

But what if an user from China and uses Google Translate, which is built into Chrome?* In this picture, the private key is translated to traditional Chinese. Now, it has additional spaces, capital letters—green; hieroglyphs—yellow; and new signs—blue.*

```
{"IV" : "6htm0TUYJhEQNwXIcVWJgA==", "V" : 1, "ITER" : 10000, "KS" : 256, "TS" : 64, "模式" : "CCM", "ADATA" : "", "密碼" : "AES", "鹽" : "skziDA4LN9M=", "CT" : "+ 9d3cyR546SDOwvufxpcncqGpLjBKufwS+XVDvqw1s5peeVDH4zILe9G4fxtbXt1tw6B9 /WoIjxHhWhVu5fyYX7p8arKE8tbDRIfp3NqUHCAIYdnk3hsl36izwYO2FG5Gf5VTMCEquTXmYBltNhtf4RFmgeMOhk ="} }
```

Translation to French:

```
{"Iv": "6htm0TUYJhEQNwXIcVWJgA ==", "v": 1, "iter": 10000, "ks": 256, "ts": 64, "mode": "ccm", "adata": "" "chiffre": "aes", "sel": "skziDA4LN9M=", "ct": "9d3cyR546SDOwvufxpcncqGpLjBKufwS +XVDvqw1s5peeVDH4zILe9G4fxtbXt1tw6B9 /WoIjxHhWhVu5fyYX7p8arKE8tbDRIfp3NqUHCAIYdnk3hsl36izwYO2FG5Gf5VTMCEquTXmYBltNhtf4RFmgeMOhk ="}
```


Translation to Hebrew:

```
{ "Iv": "6htm0TUYJhEQNwXIcVWJgA ==", "נ": 1, "iter": 10,000, "KS": 256, "TS": 64, "במצב": "CCM", "ADATA": "", "צופן": "AES", "מלח": "skziDA4LN9M =", "CT": "9d3cyR546SDOwvufxpcncqGpLjBKufwS + XVDvqw1s5peeVDH4zILe9G4fxbXt1tw6B9 / WoIjxHhWhVu5fyYX7p8arKE8tbDRIfp3NqUHCAIYdnk3hsl36izwYO2FG5Gf5VTMCEquTXmYBltNhtf4RFmgeMOhk =" }
```

Here is an attempted recovery using a reverse translation of the wrong key.*
Reverse translations from Chinese to English by Google Translate:

```
{ "IV": "6htm0TUYJhEQNwXIcVWJgA ==", "V": 1, "ITER": 10000, "KS": 256, "TS": 64, "mode": "CCM", "ADATA": " "password": "AES", "salts": "skziDA4LN9M =", "CT": "+ 9d3cyR546SDOwvufxpcncqGpLjBKufwS XVDvqw1s5peeVDH4zILe9G4fxbXt1tw6B9 / WoIjxHhWhVu5fyYX7p8arKE8tbDRIfp3NqUHCAIYdnk3hsl36izwYO2FG5Gf5VTMCEquTXmYBltNhtf4RFmgeMOhk =" }
```

Reverse translation does not work.¹³⁰ We cannot get the right private key back.¹³¹ Without the correct private key, a user cannot gain access to his or her wallet.¹³² The cryptocurrency is lost.¹³³ This case illustrates the manifold technological problems that could hinder control over crypto assets.¹³⁴ The user's control over blockchain means having control over software, program language used for making software, executable codes, smart contracts, and the process of user-program and program-program interactions.¹³⁵

130. See ANDREAS M. ANTONOPOULOS, *MASTERING BITCOIN: UNLOCKING DIGITAL CRYPTO-CURRENCIES* 63 (Mike Loukides & Allyson MacDonald eds., 2014); Khatwani, *supra* note 121.

131. See ANTONOPOULOS, *supra* note 130, at 63; Khatwani, *supra* note 121.

132. ANTONOPOULOS, *supra* note 130, at 63; Khatwani, *supra* note 121.

133. See ANTONOPOULOS, *supra* note 130, at 63.

134. See *id.*; Khatwani, *supra* note 121.

135. See ANTONOPOULOS, *supra* note 130, at 63; Iansiti & Lakhani, *supra* note 2, at 120–21, 126; Khatwani, *supra* note 121; Philipp Paech, *Blockchain: Loss of the Parties' Control over Contracts and the Hampered Courts*, BLOCKCHAINREGULATION.ORG (Oct. 30, 2017), <http://www.blockchainregulation.org/2017/10/30/blockchain-loss-of-the-parties-control-over-contracts-and-the-hampered-courts>; *What Is an Executable Distributed Code Contract?*, ETHNEWS, <http://www.ethnews.com/edcc> (last visited Apr. 18, 2018).

V. CONTROL OVER THE DECENTRALIZED NETWORK ORGANIZATION

A. *Definition of the Decentralized Network Organization*

There are a lot of names for a decentralized network organization.¹³⁶ It can be called a virtual organization, distributed computing system, DAO, decentralized autonomous community, a group of users, an association of individuals, partnership, or company.¹³⁷

We can definitely say that the decentralized network organization is an entity based on a blockchain technology, token placement performance, and an unlimited number of participants.¹³⁸ The functions and legal status of the decentralized network organization “depend on many factors, including how . . . [the e]ntity code is used, where it is used, and who uses it.”¹³⁹

If the users of a decentralized network organization become shareholders, the virtual organization becomes a registered corporate entity.¹⁴⁰ The Securities and Exchange Commission (“SEC”) “is aware that virtual organizations and associated individuals and entities increasingly are using distributed ledger technology to offer and sell instruments such as . . . [t]okens to raise capital.”¹⁴¹ “Investors who purchased DAO [t]okens were investing in a common enterprise and reasonably expected to earn profits through that enterprise when they sent ETH to [t]he DAO’s Ethereum Blockchain address in exchange for DAO [t]okens.”¹⁴²

B. *The Structure of Decentralized Network Organization*

The decentralized network organization can take any form of a legally recognized organization, or associated relationship, existing in the real world.¹⁴³ In most cases, the decentralized organization results from the interplay of the group of founders and group of token holders.¹⁴⁴

136. See SEC, *supra* note 35, at 1–2, 10; *What Is a DAO?*, *supra* note 35.

137. See ALLEN & OVERY LLP, *supra* note 62, at 5; SEC, *supra* note 35, at 1–2, 10; Iansiti & Lakhani, *supra* note 2, at 121; *What Is a DAO?*, *supra* note 35; *What Is Distributed Computing*, IBM KNOWLEDGE CTR., http://www.ibm.com/support/knowledgecenter/en/SSAL2T_8.2.0/com.ibm.cics.tx.doc/concepts/c_wht_is_dist_comptg.html (last visited Apr. 18, 2018).

138. See ALLEN & OVERY LLP, *supra* note 62, at 3; SEC, *supra* note 35, at 1, 6; *What Is a DAO?*, *supra* note 35.

139. SEC, *supra* note 35, at 4 n.10 (quoting JENTZSCH, *supra* note 93, at 1).

140. See *id.* at 1–2; *What Is a DAO?*, *supra* note 35.

141. SEC, *supra* note 35, at 10.

142. *Id.* at 11.

143. See *id.* at 3–4 & n.10 (citing JENTZSCH, *supra* note 93, at 1).

144. See *id.* at 1, 5–6.

There are three general organizational models of the decentralized network organization: (1) club of purchasers; (2) organization with membership; and (3) trust.¹⁴⁵

As the blockchain network is a collection of anonymous users, it is reasonable to implement social, economic, and technological indicators for determining control over its users' assets and the whole system.¹⁴⁶ Control over the decentralized organization depends on organizational structure.¹⁴⁷

C. *Club of Purchasers*

The decentralized organization, as a club of purchasers, has two main groups: Founders and token holders.¹⁴⁸ Founders of a decentralized network organization are considered a separate entity.¹⁴⁹ Meanwhile, the token holders group is a club, crowd, or network with informal communication.¹⁵⁰ The token can take the form of a license agreement—bonus or discount, certificate on property rights or property equivalent, gold, or fiat money.¹⁵¹

If the decentralized organization is established as an informal association, club, crowd of consumers, pool of investors, or property rights holders, then there is no control over the crowd—except contractual conditions.¹⁵² Features of control over a club include the process of group formation initiated by founders; founders organize, but do not control the crowd—the founders and users have no common assets, transactions are code dependent, and there is a free-flow of members.¹⁵³

In most cases, there is no need to control a club of users.¹⁵⁴ The emission of tokens is carried out by the founders' company, which is established by the founders of the decentralized organization.¹⁵⁵ All digital assets and technology belong to the founders' company.¹⁵⁶ As noted by the

-
145. See Van Valkenburgh et al., *supra* note 106, at 5–7.
146. See SEC, *supra* note 35, at 8, 10; Kaal & Calcaterra, *supra* note 4, at 109–10.
147. See SEC, *supra* note 35, at 14–15.
148. See *id.* at 5; Van Valkenburgh et al., *supra* note 106, at 7.
149. See SEC, *supra* note 35, at 3 n.10; Kaal & Calcaterra, *supra* note 4, at 120–21, 139–40.
150. SEC, *supra* note 35, at 5, 14–15.
151. See Van Valkenburgh et al., *supra* note 106, at 5–7, 11.
152. See *id.* at 11; SEC, *supra* note 35, at 4; Kaal & Calcaterra, *supra* note 4, at 125.
153. See SEC, *supra* note 35, at 5–6, 8; Van Valkenburgh et al., *supra* note 106, at 5.
154. See SEC, *supra* note 35, at 4; *What Is a DAO?*, *supra* note 35.
155. ALLEN & OVERY LLP, *supra* note 62, at 3.
156. See SEC, *supra* note 35, at 1.

SEC, “the pseudonymity and dispersion of . . . [t]oken holders ma[ke] it difficult for them to . . . effect[uate] change or to exercise meaningful control.”¹⁵⁷

D. *Single Organization with a Membership*

The founders of a decentralized network organization and the token holders can form a single legal entity.¹⁵⁸ A single group is based on formal corporate rules and a governance system.¹⁵⁹ Tokens constitute a membership right in the company.¹⁶⁰ The token can be viewed as a share, which grants members a right to vote and make decisions on fund allocation.¹⁶¹ Token holders are considered stockholders of the company.¹⁶² Aspects include: Pseudonymity of some shareholders, problems with the register of shareholders, *Know Your Customer* and *Anti-Money Laundering* problems—as identities cannot be verified in real life—and the organization’s corporate rules may not comply with corporate law.¹⁶³

Control over the organization as a single entity can be determined by the foundation’s corporate rules.¹⁶⁴ Possession of the majority of voting rights and the ability to make a decision on the company’s assets, or appoint managers, indicates control over the decentralized organization, regardless of the technological information features and nature of a digital asset.¹⁶⁵

E. *Trust*

Founders of a decentralized network organization can establish a managing or trust company, which manages the assets of the decentralized organization.¹⁶⁶ The assets are placed in a decentralized organization by the investor.¹⁶⁷ Then the beneficiaries receive tokens.¹⁶⁸ The token holder

157. *Id.* at 14.

158. *See id.* at 1, 3–4 n.10; ALLEN & OVERY LLP, *supra* note 62, at 5.

159. *See* SEC, *supra* note 35, at 3.

160. ALLEN & OVERY LLP, *supra* note 62, at 3.

161. *Id.*; SEC, *supra* note 35, at 4, 15.

162. *See* SEC, *supra* note 35, at 15.

163. *See id.* at 3, 6, 14; ALLEN & OVERY LLP, *supra* note 62, at 5; David Adler, *Blockchain and Money Laundering*, FORDHAM J. CORP. & FIN. L.: BLOG (Dec. 15, 2017), <http://news.law.fordham.edu/jcfl/2017/12/15/blockchain-and-money-laundering/>.

164. *See* SEC, *supra* note 35, at 3, 3–4 n.10; Van Valkenburgh et al., *supra* note 106, at 5.

165. *See* ALLEN & OVERY LLP, *supra* note 62, at 3–4.

166. *See id.* at 3, 6; SEC, *supra* note 35, at 2; *What Is a DAO?*, *supra* note 35.

167. *See* ALLEN & OVERY LLP, *supra* note 62, at 3; *What Is a DAO?*, *supra* note 35.

effectively becomes a beneficiary.¹⁶⁹ The problem with this structure is the anonymity of token holders, which prevents the ability to maintain a beneficiary registry.¹⁷⁰

VI. CONTROL OVER NETWORK BY GOVERNMENT AUTHORITIES

State authorities are deeply concerned with money laundering and criminal activities on blockchain networks, and are seeking a new way to design controls and regulations of the market's behavior by tailoring legal norms to blockchain features.¹⁷¹ The Economic and Financial Affairs Council and the Justice and Home Affairs Council of the European Union pointed out that terrorist groups are able to transfer money into the Union's financial system or within virtual currency networks by concealing transfers or by benefiting from a certain degree of anonymity on those platforms.¹⁷² Competent authorities have started to monitor the use of virtual currencies and seek ways to obtain control over the distributed blockchain network system—or, in other words, attempt to get power to exercise a controlling influence over the network's transactions and participants.¹⁷³ It is a difficult task due to anonymity.¹⁷⁴ Technically, only the pool of miners is able to have partial control over separate cryptocurrencies in exceptional circumstances.¹⁷⁵

The intention of state authorities to control is in contradiction with rights to privacy and freedom.¹⁷⁶ At the same time, the blockchain technology creates a problem for participants too.¹⁷⁷ The users cannot restore the situation after a mistake or remove information about transactions on blockchain, and have a right to be forgotten, as all information about

168. ALLEN & OVERY LLP, *supra* note 62, at 3; *see also* *What Is a DAO?*, *supra* note 35.

169. *See* ALLEN & OVERY LLP, *supra* note 62, at 3.

170. *See id.* at 5–6; Adler, *supra* note 163; *What Is a DAO?*, *supra* note 35.

171. Adler, *supra* note 163; *see also* Vaishali Dixit, *Blockchain*, CODE BREW LABS (Dec. 30, 2017), <http://www.code-brew.com/blockchain/>; Adam Web, *France Cryptocurrency Regulations Are on the Way (the Future of Bitcoin, Ethereum, Ripple in France)*, SMARTEREUUM (Jan. 22, 2018), <http://www.smartereum.com/france-attempting-regulate-cryptocurrency-market/>.

172. *Proposal for a Directive of the European Parliament and of the Council Amending Directive 2015/849 on the Prevention of the Use of the Financial System for the Purposes of Money Laundering or Terrorist Financing and Amending Directive 2009/101/EC*, at 2–3, 12, COM (2016) 450 final (July 5, 2016).

173. *See id.* at 7, 9.

174. *Id.* at 2, 12.

175. *See id.* at 7.

176. *See* Bogost, *supra* note 35.

177. COM (2016) 450 final, *supra* note 172, at 2–3; Bogost, *supra* note 35.

transactions is immutable.¹⁷⁸ A lot of questions arise concerning compliance with *Know Your Customers* policy, and the transfer of personal data from a state or intermediary to a third country, or an intermediary with an inadequate level of data protection.¹⁷⁹

A. *Entrance-Exit Nodes*

The blockchain technology makes it possible to hide information and identity inside the network—but, there is a loophole.¹⁸⁰ The anonymity and pseudonymity can be partially overcome by control of an Entrance-Exit Node (“EEN”) of the network system.¹⁸¹ EENs are nodes of the blockchain network that simultaneously interact with other nodes of the blockchain network.¹⁸² More specifically, an EEN is a node between decentralized and centralized systems.¹⁸³ Usually, the EEN is a virtual currency exchange platform—or custodian wallet provider—that the European parliament views as a threat for money laundering.¹⁸⁴

B. *EEN—Vinnik Case*

The United States Financial Crimes Enforcement Network investigated the operations of money transmitter, BTC-e, which was involved in money laundering.¹⁸⁵ Mr. Vinnik, who was an operator of BTC-e, was tracked and discovered by links between his cryptocurrency account and an account on a WebMoney payment system.¹⁸⁶

178. Kaal & Calcaterra, *supra* note 4, at 114; Reggie O’Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 N.C. BANKING INST. 177, 180, 187 (2017).

179. See *KYC and Blockchain*, FINEXTRA (Mar. 30, 2017), <http://www.finextra.com/blogposting/13903/kyc-and-blockchain>; KYC-CHAIN, <http://www.kyc-chain.com> (last visited Apr. 18, 2018).

180. See Kaal & Calcaterra, *supra* note 4, at 110–12.

181. See *id.*; ANTONOPOULOS, *supra* note 130, at 140; Bill Buchanan, *It’s All About Entry and Exit Nodes*, LINKEDIN (Dec. 7, 2015), <http://www.linkedin.com/pulse/its-all-entry-exit-nodes-william-buchanan>.

182. Kaal & Calcaterra, *supra* note 4, at 118; Buchanan, *supra* note 181.

183. Kaal & Calcaterra, *supra* note 4, at 117, 125; Buchanan, *supra* note 181.

184. See COM (2016) 450 final, *supra* note 172, at 2; ANTONOPOULOS, *supra* note 130, at 140.

185. Steve Hudak, *FinCEN Fines BTC-e Virtual Currency Exchange \$110 Million for Facilitating Ransomware, Dark Net Drug Sales*, FINCEN: NEWSROOM (July 27, 2017), <http://www.fincen.gov/news/news-releases/Fincen-Fines-btc-e-virtual-currency-exchange-110-million-facilitating-ransomware>.

186. Jake Adelstein, *The World’s Most Infamous Billion-Dollar Bitcoin Launderer Nabbed at Last?*, DAILY BEAST (July 27, 2017, 12:30 PM), <http://www.thedailybeast.com/the-worlds-most-infamous-billion-dollar-bitcoin-launderer>.

This case shows that focusing on an EEN, such as WebMoney, can assist in revealing the identity of the user on a blockchain network.¹⁸⁷

C. *Control over Network Is Control over Identity*

Control over an EEN only partially addresses the problem of control over the network, users, and criminal transactions.¹⁸⁸ As noted by European authorities, strict regulation of:

[V]irtual exchange platforms and custodian wallet providers will not entirely address the issue of anonymity attached to virtual currency transactions, as a large part of the virtual currency environment will remain anonymous because users can also transact without exchange platforms or custodian wallet providers. To combat the risks related with anonymity, national Financial Intelligence Units . . . should be able to associate virtual currency addresses to the identity of the owner of virtual currencies.¹⁸⁹

VII. CONCLUSION

We can state that blockchain decentralized organizations are structured and managed in a simplistic manner like the first Roman communities.¹⁹⁰ The improvement of network organizations regulations is similar to the development of ancient communities, moving forward along a complex path.¹⁹¹ Though, there is a difference.¹⁹² For ancient communities, the regulations were invented; but for the decentralized organization, existing regulations were implemented.¹⁹³

nabbed-at-last; *Detained Russian Controlled Bitcoin Exchange*, HYPE.CODES (July 27, 2017), <http://www.hype.codes/russian-was-detained-greece-controlled-bitcoin-exchange>.

187. See *Detained Russian Controlled Bitcoin Exchange*, *supra* note 186.

188. See COM (2016) 450 final, *supra* note 172, at 2–3; *Detained Russian Controlled Bitcoin Exchange*, *supra* note 186.

189. COM (2016) 450 final, *supra* note 172, at 22.

190. See BERMAN, *supra* note 36, at 216; Iansiti & Lakhani, *supra* note 2, at 120–21; Samuelsson, *supra* note 21, at 22–23.

191. See COM (2016) 450 final, *supra* note 172, at 2–3; BERMAN, *supra* note 36, at 216; Samuelsson, *supra* note 21, at 23; Buchanan, *supra* note 181.

192. Compare Iansiti & Lakhani, *supra* note 2, at 120–21, with Samuelsson, *supra* note 21, at 21–22.

193. See Kaal & Calcaterra, *supra* note 4, at 109, 139; Samuelsson, *supra* note 21, at 21.

Realization of control on the blockchain network is a difficult task for every participant, including state authorities and users.¹⁹⁴ At the same time, the founders of a decentralized organization can effectively attract and fulfill control over the accumulated funds.¹⁹⁵ The anonymity of decentralized network participants and peculiarities of technology prevent governments from efficient control over the network.¹⁹⁶ Only the goodwill of participants to disclose information and their willingness to pay taxes—or in other words, the high morality of participants—can confirm governments' authority.¹⁹⁷

194. See SEC, *supra* note 35, at 13, 15; ALLEN & OVERY LLP, *supra* note 62, at 6; Kaal & Calcaterra, *supra* note 4, at 125, 142.
 195. See SEC, *supra* note 35, at 12–13, 15.
 196. Kaal & Calcaterra, *supra* note 4, at 134.
 197. See *id.* at 136; SEC, *supra* note 35, at 2, 7 n.25.